MODEL

ICA-2009-2 Calculator Desk Set

HEATHKIT®

ASSEMBLY MANUAL

HEATH COMPANY • BENTON HARBOR, MICHIGAN

Model ICA-2009-2 Calculator Desk Set

HEATHKIT

RUSH

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595-1583

Dear Customer:

The Heathkit electronic product you have purchased is one of the best performing electronic products in the world.

Here's how we aim to keep it that way:

Your Heathkit Warranty

During your first 90 days of ownership, any parts which we find are defective, either in materials or workmanship, will be replaced or repaired free of charge. And we'll pay shipping charges to get those parts to you — anywhere in the world.

If we determine a defective part has caused your Heathkit electronic product to need other repair, through no fault of yours, we will service it free — at the factory, at any retail Heathkit Electronic Center, or through any of our authorized overseas distributors.

This protection is exclusively yours as the original purchaser. Naturally, it doesn't cover damage by use of acid-core solder, incorrect assembly, misuse, fire, flood or acts of God. But, it does insure the performance of your Heathkit electronic product anywhere in the world — for most any other reason.

After-Warranty Service

What happens after warranty? We won't let you down. If your Heathkit electronic product needs repairs or you need a part, just write or call the factory, your nearest retail Heathkit Electronic Center, or any Heath authorized overseas distributor. We maintain an inventory of replacement parts for each Heathkit model at most locations — even for many models that no longer appear in our current product line-up. Repair service and technical consultation are available through all locations.

We hope you'll never need our repair or replacement services, but it's nice to know you're protected anyway — and that cheerful help is nearby.

Sincerely,

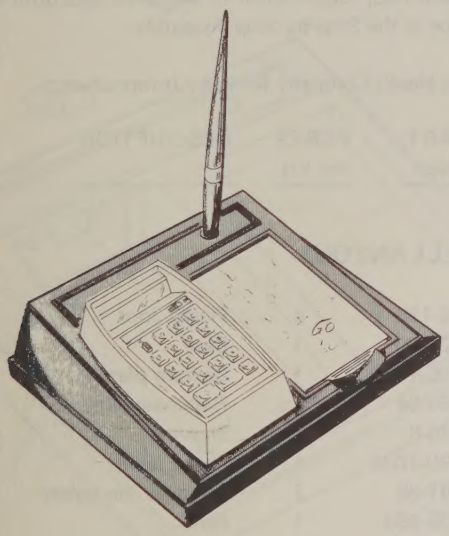
HEATH COMPANY
Benton Harbor, Michigan 49022

Assembly and Operation of the

HEATHKIT

CALCULATOR DESK SET

MODEL ICA-2009-2



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HEATH COMPANY
BENTON HARBOR, MICHIGAN 49022

INTRODUCTION

The Heathkit Model ICA-2009-2 Calculator Desk Set is the perfect companion for your IC-2009 Portable Calculator. This Desk Set provides a built-in battery charger that frees the one that came with your Calculator for use at another location.

As soon as the Calculator is placed in the Desk Set, the battery automatically begins to charge. Therefore, by leaving the Calculator in the Desk Set, you can keep the battery fully charged and be assured of maximum operating time for portable operation.

The Desk Set has been designed so that the Calculator can easily slide in and out of it and so that the Calculator and paper are at the proper angle for reading and writing. An engravable nameplate has been provided so you can add a special "personalized" touch.

The low-profile, wood-grain finished, high-impact plastic housing will complement any decor and will provide long, dependable service.

Refer to the "Kit Builders Guide" for complete information on unpacking, parts identification, tools, wiring, soldering, and step-by-step assembly procedures.

PARTS LIST

Check each part against the following list. The key numbers correspond to the numbers on the Parts Pictorial. Some parts may be packed in envelopes. After these parts have been identified, return them to the envelopes until they are called for in the Step-by-Step Assembly.

Write to Heath Company for Price Information.

CIRCUIT PARTS

KEY No.	PART No.	PARTS Per Kit	DESCRIPTION	PRICE Each
A1	54-828	1	Power transformer	
	89-49	1	Line cord	
A2	258-5	2	Spring clip	
A3	259-30	2	Solder lug	
	344-21	1	Red wire	
A4	421-48	1	Thermal fuse	
A5	432-797	2	Fuse connector	

HARDWARE

KEY No.	PART No.	PARTS Per Kit	DESCRIPTION	PRICE Each
B1	250-582	2	#2 x 1/4" self-tapping screw	
B2	250-186	2	#4 x 3/8" self-tapping screw	
B3	250-477	2	#4 x 3/4" self-tapping screw	

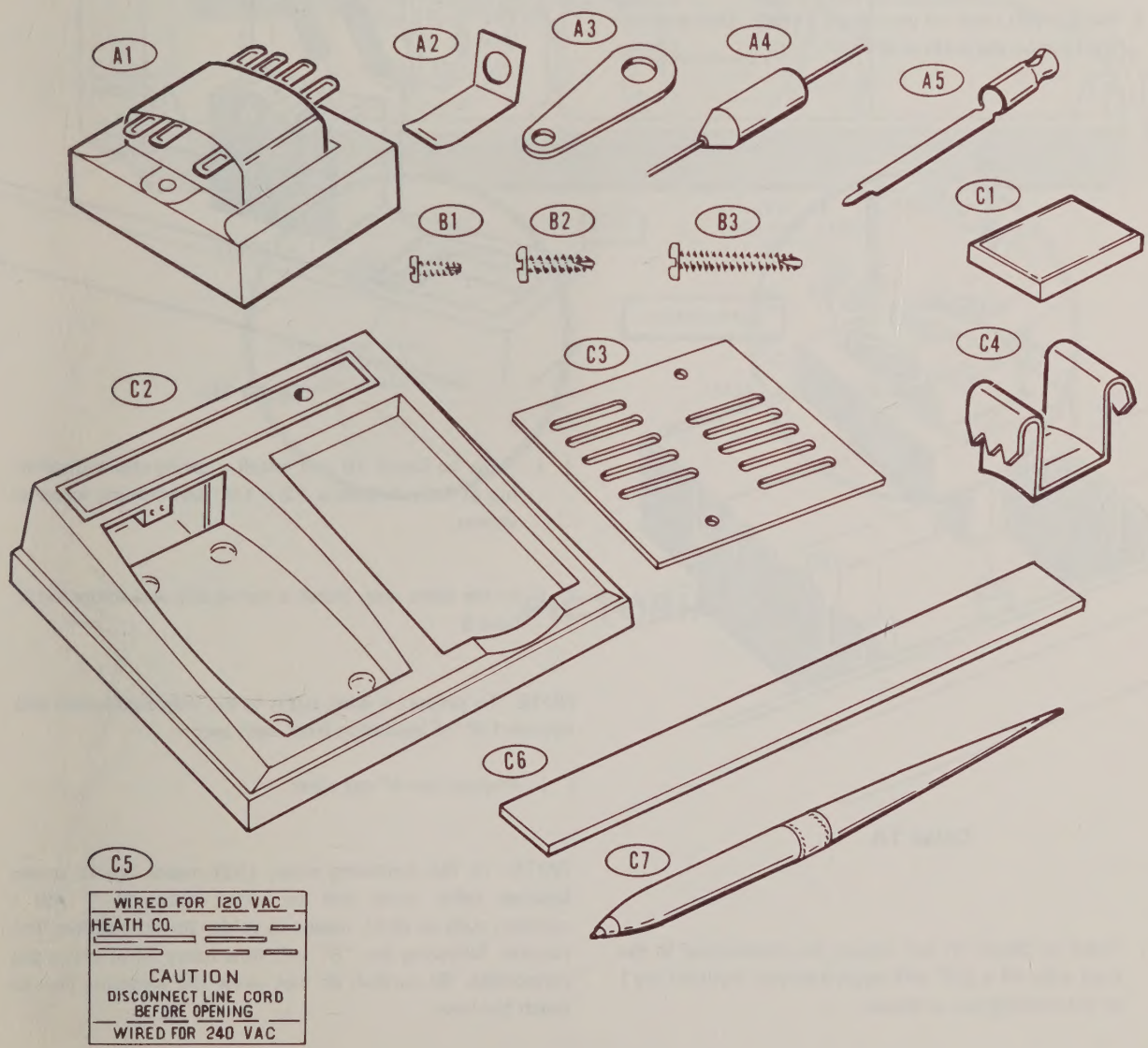
MISCELLANEOUS

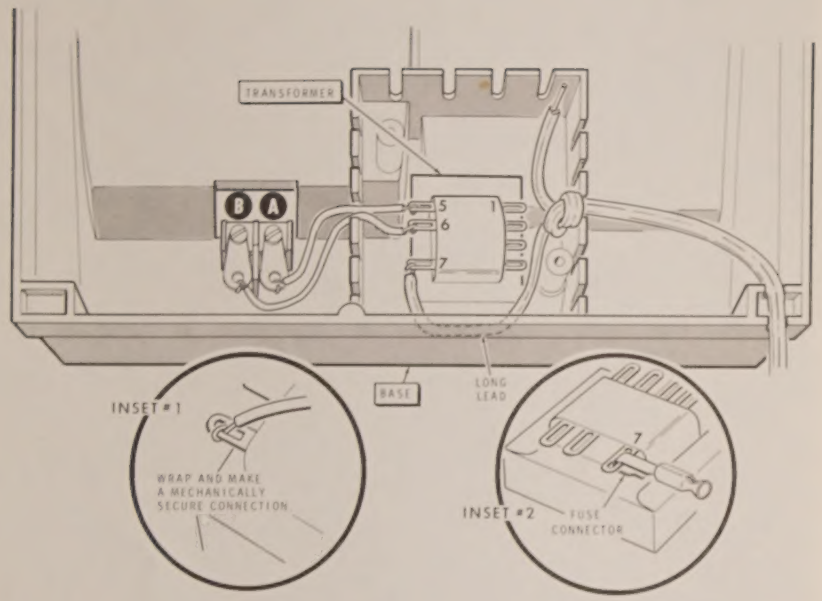
KEY No.	PART No.	PARTS Per Kit	DESCRIPTION	PRICE Each
C1	75-138	4	Plastic foot	
C2	92-100	1	Base	
C3	205-1449	1	Bottom plate	
C4	260-84	1	Retaining clip	
	346-6	1	Sleeving	
C5	390-1036	1	Power label	
C6	391-86	1	Personal nameplate	
C7	406-653	1	Pen	
	703-3	1	Paper pad	
	597-308	1	Kit Builders Guide	
	597-260	1	Parts Order Form	
	391-34	1	Blue and white label	
		1	Assembly Manual (See front cover for part number.)	
		1	Solder (Additional 3' rolls of solder, #331-6, can be ordered for 15 cents each.)	

To order a replacement part, use the Parts Order Form furnished with this kit. If a Parts Order Form is not available, refer to "Replacement Parts" inside the rear cover of the Manual.

The above prices apply only on purchases from the Heath Company where shipment is to a U.S.A. destination. Add 10% (minimum 25 cents) to the price when ordering from a Heathkit Electronic Center to cover local sales tax, postage, and handling. Outside the U.S.A. parts and service are available from your local Heathkit source and will reflect additional transportation, taxes, duties, and rates of exchange.

PARTS PICTORIAL





PICTORIAL 1

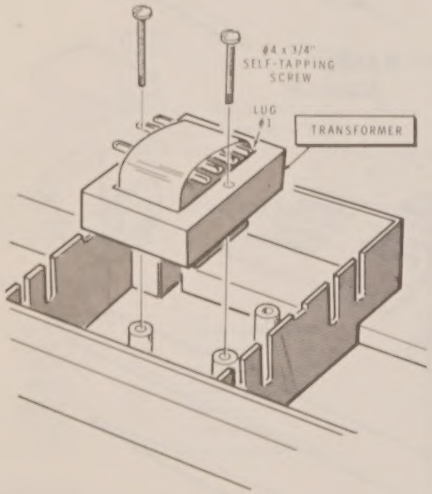
STEP-BY-STEP ASSEMBLY

Before you start to assemble this kit, read the "Kit Builders Guide" for complete information on tools, wiring, soldering, and step-by-step assembly procedures. Be sure to position all parts and wires as they are shown in the Pictorials.

BASE ASSEMBLY AND WIRING

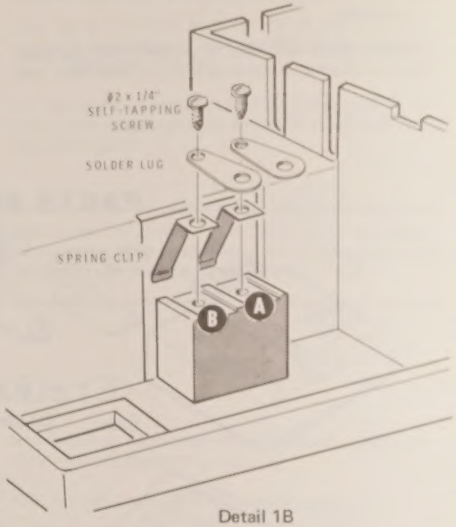
Refer to Pictorial 1 for the following steps.

( ) Place a soft cloth on your work surface. Then position the base on the cloth as shown.



Detail 1A

( ) Refer to Detail 1A and mount the transformer in the base with #4 x 3/4" self-tapping screws. Position lug 1 of the transformer as shown.



Detail 1B

( ) Refer to Detail 1B and install a spring clip and solder lug at hole A with a #2 x 1/4" self-tapping screw as shown.

( ) In the same way, install a spring clip and solder lug at hole B.

NOTE: To prepare a wire, cut it to the indicated length and remove 1/4" of insulation from each end.

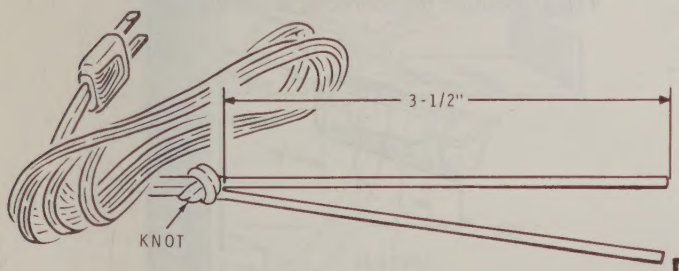
( ) Prepare two 4" red wires.

NOTE: In the following steps, (NS) means not to solder because other wires will be added later. "S–" with a number, such as (S-3), means to solder the connection. The number following the "S" tells how many wires are at the connection. Be careful; do not allow the soldering iron to touch the base.

CAUTION: Use care when making connections to the lugs of the transformer. Too much force applied to these fragile lugs can cause damage to the transformer.

( ) Connect a 4" red wire from solder lug A (S-1) to transformer lug 5 (S-1).

( ) Connect a 4" red wire from solder lug B (S-1) to transformer lug 6 (S-1).

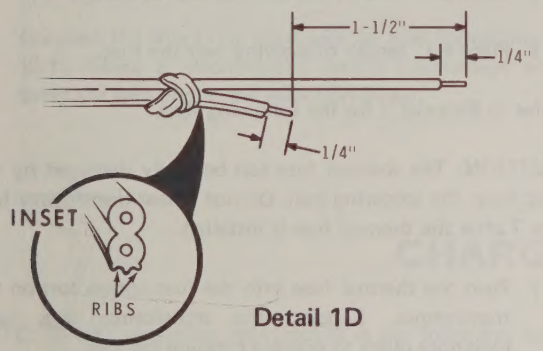


Detail 1C

Refer to Detail 1C for the following steps.

( ) Locate the line cord and tie a knot in it 4-1/2" from the end as shown. Then cut off the end 3-1/2" from the knot.

( ) Separate the two wires of the line cord back to the knot.



Detail 1D

Refer to Detail 1D for the following steps.

( ) Refer to the inset drawing and identify the ribbed wire of the line cord. Cut a 1-1/2" length from this wire and discard it.

( ) Remove 1/4" of insulation from the ends of the line cord wires. Twist the fine wires and melt a small amount of solder on the exposed wire ends.

( ) Bend the line cord wires to form a hook in the exposed ends.

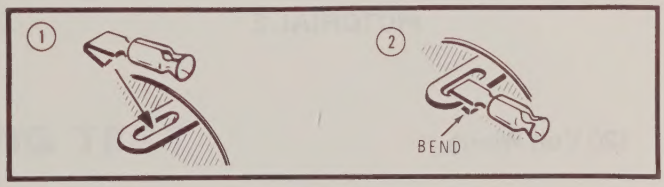
NOTE: In some of the following steps, you will be asked to "make mechancially secure connections." Do this by inserting the hooked end of the wire through the hole in the lug and crimping the wire to the lug before soldering. See the inset drawing in Pictorial 1.

Refer to Pictorial 1 for the following steps.

( ) Connect the long line cord wire to transformer lug 7 (NS). Make a mechanically secure connection.

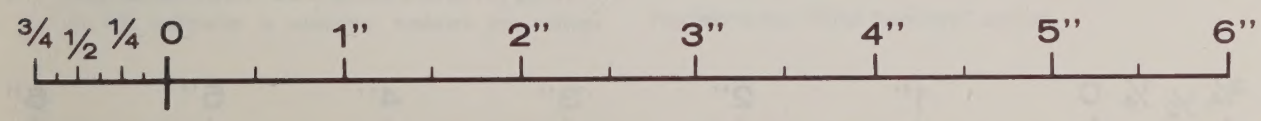
Detail 1E

( ) Refer to Detail 1E and prepare the two fuse connectors as shown. Set one of these connectors aside until later.



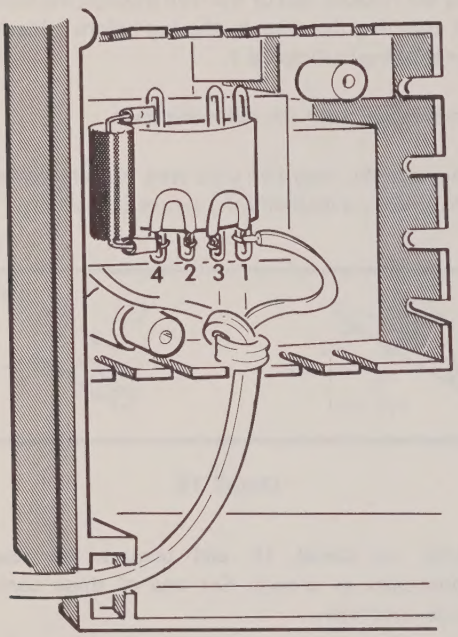
Detail 1F

( ) Refer to Detail 1F and install a fuse connector in transformer lug 7 (S-2). Be careful not to get solder into the connector. Position the connector as shown in inset drawing #2 on Pictorial 1.



ALTERNATE LINE VOLTAGE WIRING

NOTE: The transformer can be wired for operation from a 120 volt or 240 volt 50/60 Hz power source. In the U.S.A., 120 volts is most often used, while in other countries 240 volts is more common. Use only the instructions that agree with the line voltage in your area.



PICTORIAL 2

120 Volt Wiring

Refer to Pictorial 2 for the following steps.

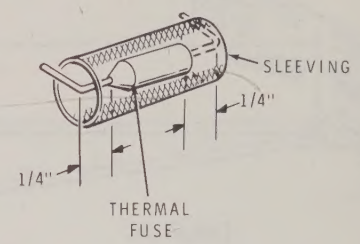
( ) Connect the short line cord wire to transformer lug 1 (NS). Make a mechanically secure connection and bend the wire end in the direction shown.

( ) Prepare two 1-1/4" red wires. Then bend the wire ends to form hooks.

( ) Connect a red wire between transformer lugs 1 (S-2) and 3 (S-1). Make mechanically secure connections and bend the wire ends in the direction shown.

( ) Connect a red wire between transformer lugs 2 (S-1) and 4 (NS). Make mechanically secure connections and bend the wire ends in the direction shown.

( ) Install a fuse connector (as before) in transformer lug 4 (S-2). Position the connector as shown.



Detail 2A

Refer to Detail 2A for the following steps.

( ) Locate the thermal fuse and cut both leads to 1/2".

( ) Bend each lead of the thermal fuse as shown.

( ) Place a 1" length of sleeving over the fuse.

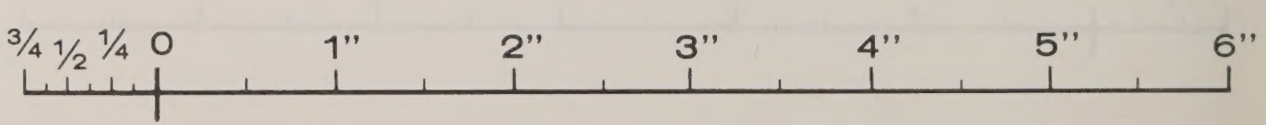
Refer to Pictorial 2 for the following step.

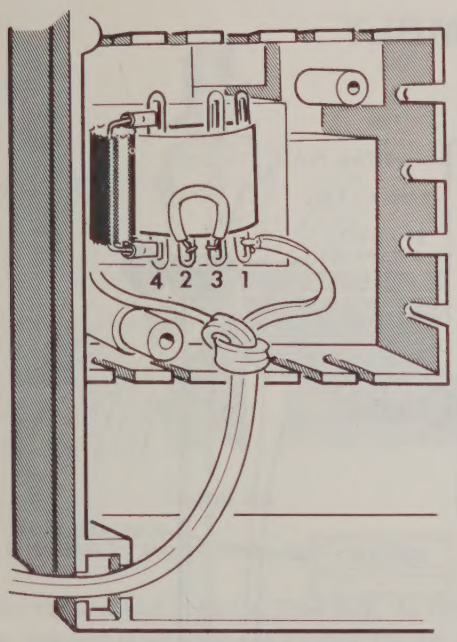
CAUTION: The thermal fuse can be easily damaged by the heat from the soldering iron. Do not reheat transformer lugs 4 or 7 after the thermal fuse is installed.

( ) Push the thermal fuse into the fuse connectors on the transformer. Support the transformer lugs with long-nose pliers to prevent bending the lugs.

This completes the wiring of the Desk Set. Check to see that all connections are soldered and that none of the fine wires are touching another lug or the frame of the transformer.

Proceed to the "Charging Test" section.





PICTORIAL 3

240 Volt Wiring

Refer to Pictorial 3 for the following steps.

( ) Connect the short line cord wire to transformer lug 1 (S-1). Make a mechanically secure connection and bend the wire end in the direction shown.

( ) Prepare a 1-1/4" red wire. Then bend the wire ends to form hooks.

( ) Connect a red wire between transformer lugs 2 (S-1) and 3 (S-1). Make mechanically secure connections and bend the wire ends in the direction shown.

Refer to Detail 2A for the following steps.

( ) Cut both leads of the thermal fuse to 1/2".

( ) Bend both leads of the thermal fuse as shown.

( ) Place a 1" length of sleeving over the fuse.

Refer to Pictorial 3 for the following step.

( ) Install a fuse connector as shown, in transformer lug 4 as before (S-1). Position the connector as shown.

CAUTION: The thermal fuse can be easily damaged by the heat from the soldering iron. Do not reheat transformer lugs 4 and 7 after the thermal fuse is installed.

( ) Push the thermal fuse into the fuse connectors on the transformer. Support the transformer lugs with long-nose pliers so you do not bend the lugs.

This completes the wiring of the Desk Set. Check to see that all connections are soldered and that none of the fine wires are touching any other lug or the frame of the transformer.

CHARGING TEST

NOTE: If you encounter any trouble in the following test, unplug the line cord of the Desk Set and refer to the "In Case of Difficulty" section of this Manual.

WARNING: Line voltage will be present at lugs 1, 2, 3, 4, and 7 of the transformer. Refer to Pictorial 3. Do not touch these lugs when the line cord of the Desk Set is plugged into an AC outlet.

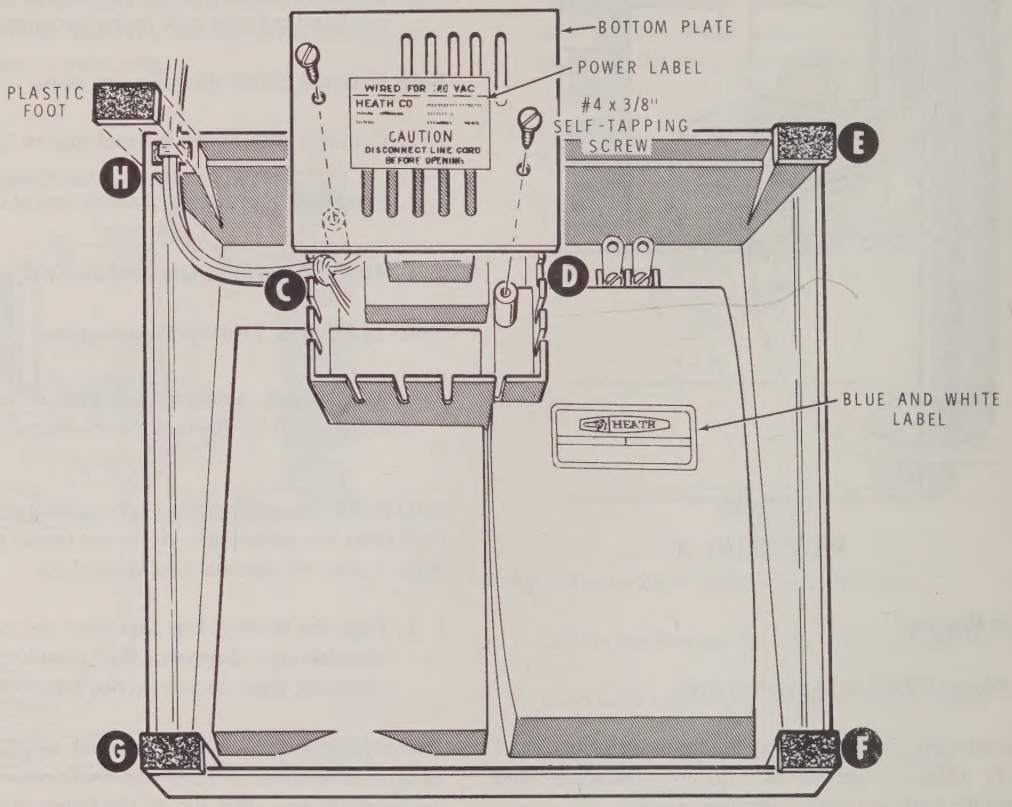
( ) Plug the line cord of the Desk Set into an AC outlet. If an AC voltmeter is available, measure the voltage between solder lugs A and B. The voltage should be approximately 16 volts AC.

If no meter is available, and no problem is encountered after the Desk Set is plugged in for a period of one minute, you can assume it is working properly.

( ) Disconnect the line cord of the Desk Set from the AC outlet.

Proceed to the "Final Assembly" section.

FINAL ASSEMBLY



PICTORIAL 4

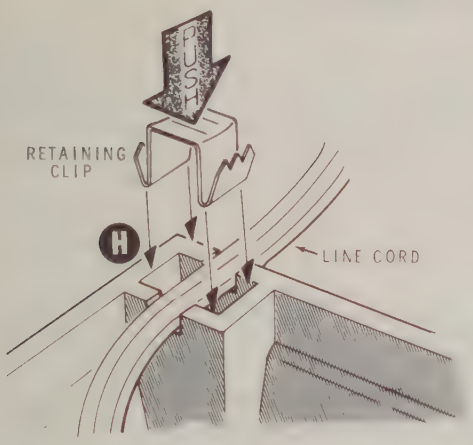
Refer to Pictorial 4 for the following steps.

( ) Mount the bottom plate to the base as shown with #4 x 3/8" self-tapping screws. Make sure the line cord is positioned in slot C and the red wires coming from the solder lugs are in slot D. (Slots C and D are the two widest slots.)

( ) Locate the power label. If the Desk Set was wired for 120 Volt operation, cut off and discard the WIRED FOR 240 VAC. If the Desk Set was wired for 240 Volt operation, cut off and discard the WIRED FOR 120 VAC.

( ) Remove the protective backing from the power label and press the label in place on the bottom plate as shown.

( ) Remove the protective backing from the blue and white label and press the label into position. Always mention the numbers on this label in any communications you have with the Heath Company about this kit.



Detail 4A

Refer to Detail 4A for the following steps.

( ) Place the line cord in slot H. Then push the retaining clip into slot H until the clip is below the top of the slot. Make sure the teeth on the clip bite into the sides of the slot.

( ) Install plastic feet at E, F, G, and H. First, remove the protective backing from a foot; then press the foot in place as shown in Pictorial 4.

Refer to Pictorial 5 for the following steps.

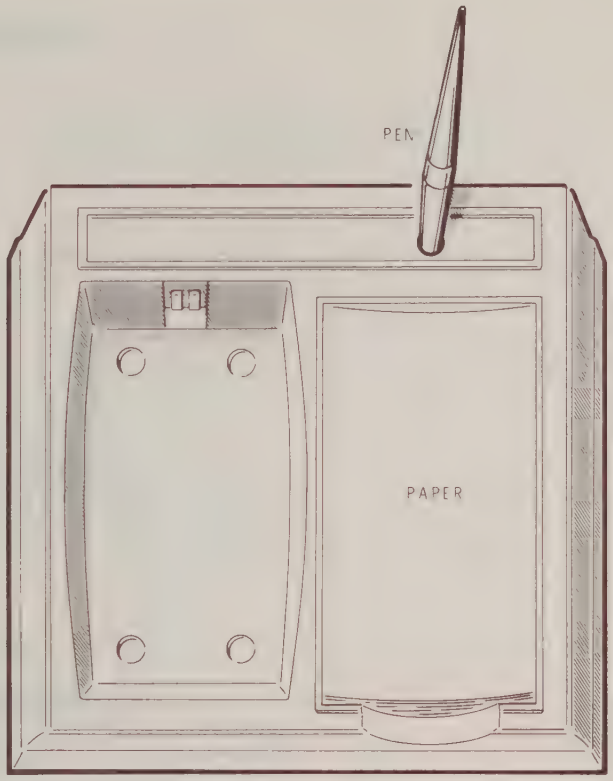
( ) Remove the band from the paper pad and place it in position as shown.

( ) Unwrap the pen and insert it in its holder as shown.

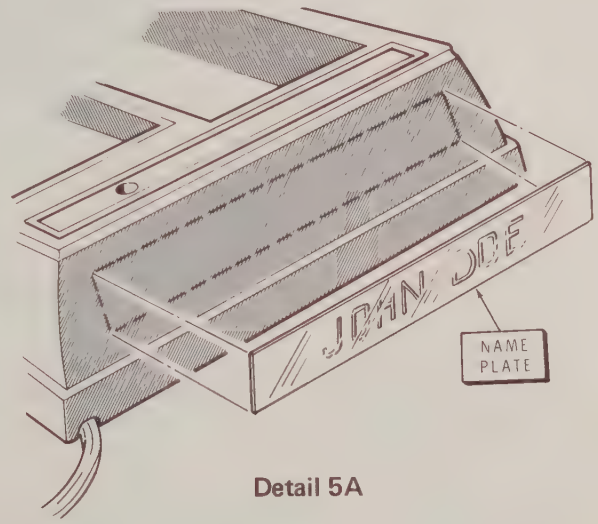
This completes the assembly of your Desk Set.

NOTE: You can have your Desk Set "personalized" by having your name engraved on the nameplate. Many jewelers and trophy shops do this as part of their business. If you have the nameplate engraved, have it done before the plate is installed.

To install the nameplate, remove the protective backing and press the nameplate in place as shown in Detail 5A.



PICTORIAL 5



Detail 5A

OPERATION

Plug the line cord into an AC outlet. Then slide the Calculator in place in the Desk Set as shown in Figure 1. Make sure the spring clips are touching the charging pins on the Calculator.

The Calculator does not have to be turned off to install it in the Desk Set. You can operate the Calculator while it is in the Desk Set and the battery will still be charged.

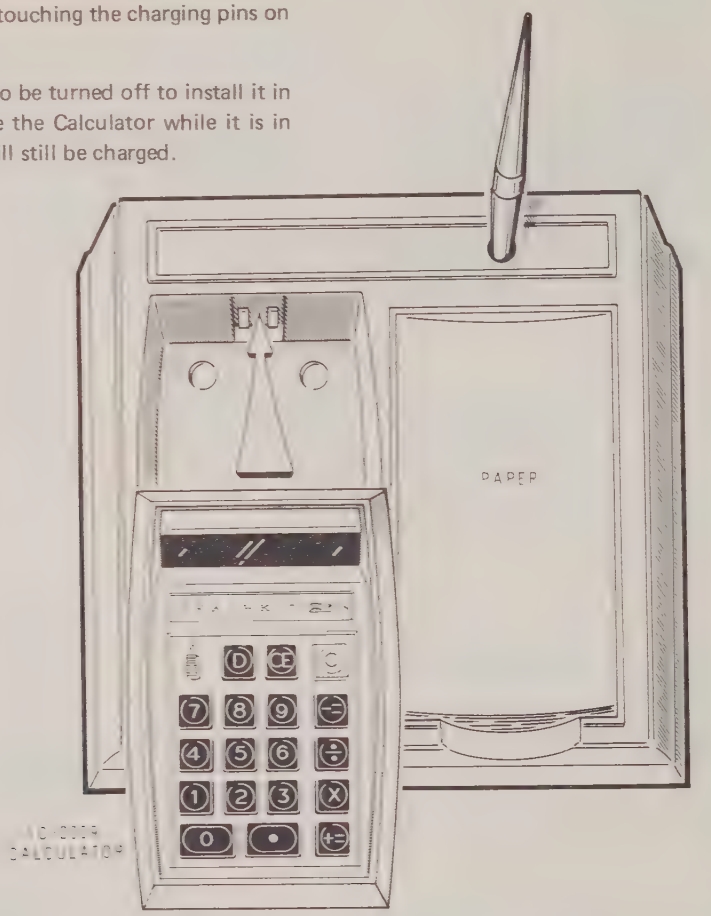


Figure 1

MAINTENANCE

To clean your Desk Set, first make sure that it is unplugged; then apply a small quantity of liquid dishwashing detergent and water solution to a clean, soft cloth and wipe the surface of the Desk Set.

Paper refills may be obtained from many stationery or variety stores. These stores usually carry 3" x 5" pre-cut paper in loose sheets or in pads.

Pen refills are also available from stationery or variety stores. The type supplied with the kit is "Schaeffer Pen Co.", Type B, with blue ink and medium point. Other colors and point types are also available, as well as "universal" types which fit many types of pens.

IN CASE OF DIFFICULTY

The following paragraphs deal with the types of difficulties that may show up right after the kit is assembled, before you can put it into operation. These difficulties are most likely to be caused by assembly errors or faulty soldering.

The following checks will help you locate any error of this type that might have been made.

1. Recheck the wiring. Trace each lead in colored pencil on the Pictorial as it is checked. It is frequently helpful to have a friend check your work. Someone who is not familiar with the unit may notice something consistently overlooked by the builder.

2. About 90% of the kits that are returned for repair, do not function properly due to poor connections and soldering. Therefore, many troubles can be eliminated by reheating all connections to make sure that they are soldered as described in the "Soldering" section of the "Kit Builders Guide."

3. Check for bits of solder, wire ends, or other foreign matter which may be lodged in the wiring.

4. If, after careful checks, the trouble is still not located and a voltmeter is available, check voltage readings against those shown on the Schematic Diagram on Page 12.

NOTE: In an extreme case where you are unable to resolve a difficulty, refer to the "Customer Service" information inside the back cover of the Manual. Your Warranty is inside the front cover.

TROUBLESHOOTING CHART

NOTES	PROBLEM	POSSIBLE CAUSE	SOLUTION
Plug line cord of Desk Set into AC wall outlet. Calculator in Desk Set.	Calculator battery not charging.	1. Spring clips not making contact with pins on calculator.	Bend clips slightly.
		2. Spring clips corroded.	Buff with fine-grain sandpaper or emery cloth.
		3. Thermal fuse TF1.	Replace.
		4. Transformer T1.	Replace.
An AC voltmeter is required. Calculator not in Desk Set.	No voltage at spring clips. It should be approximately 16 VAC.	1. Thermal fuse TF1.	Replace.
		2. Transformer T1.	Replace.

SPECIFICATIONS

Operating Temperature	10° to 40°C (50° to 104°F).
Input Voltage	120/240 volts, AC, 50/60 Hz.
Power Requirements	3 watts.
Paper Requirements	3" x 5".
Pen Cartridge	Schaeffer, Type B, blue ink, medium point (or equivalent).
Dimensions	
Without pen	8-1/4" wide x 8-3/4" deep x 2-1/8" high.
With pen	8-1/4" wide x 8-3/4" deep x 7-1/2" high.
Weight (excluding Calculator)	18 oz.

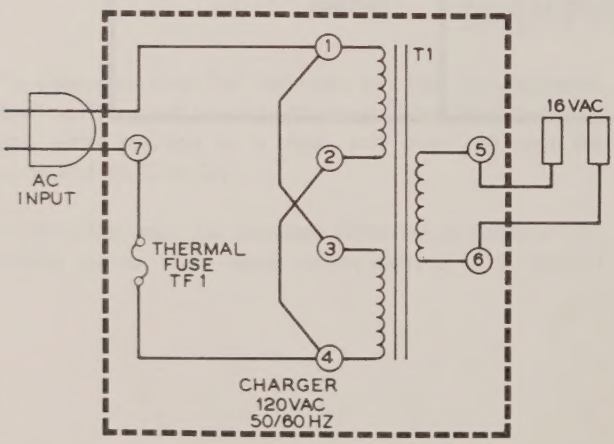
The Heath Company reserves the right to discontinue instruments and to change specifications at any time without incurring any obligation to incorporate new features in instruments previously sold.

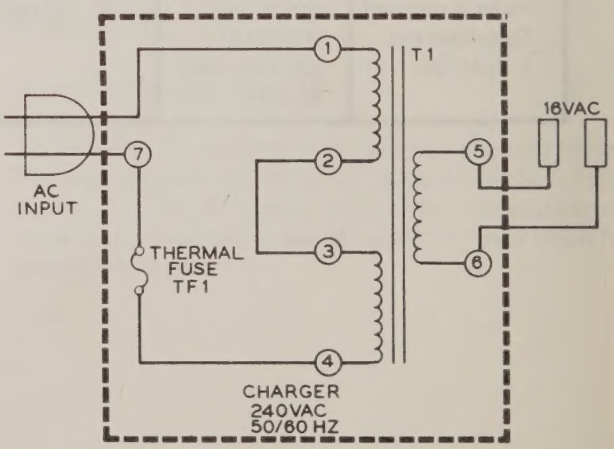
CIRCUIT DESCRIPTION

Refer to the Schematic Diagram while you read the following information.

When the Desk Set is connected to the AC line, the stepped-down voltage from the secondary of T1 is applied to the spring clips.

The secondary of T1 is a special high-resistance winding which limits the current to a safe value. Fuse, TF1, protects the transformer from a short circuit on the secondary of T1.





CUSTOMER SERVICE

REPLACEMENT PARTS

If you need a replacement part, please fill in the Parts Order Form that is furnished and mail it to the Heath Company. Or, if you write a letter, include the:

- **Part number** and **description** as shown in the **Parts List.**
- Model number and Series number from the blue and white label.
- Date of purchase.
- Nature of the defect.

Please do not return parts to the factory unless they are requested. Parts that are damaged through carelessness or misuse by the kit builder will not be replaced without cost, and will not be considered in warranty.

Parts are also available at the Heathkit Electronic Centers listed in your catalog. Be sure to provide the Heath part number. Bring in the original part when you request a warranty replacement from a Heathkit Electronic Center.

NOTE: Replacement parts are maintained specifically to repair Heathkit products. Parts sales for other reasons will be declined.

TECHNICAL CONSULTATION

Need help with your kit? . . . . Self-Service? . . . . Construction? . . . . Operation? . . . . Call or write for assistance. You'll find our Technical Consultants eager to help with just about any technical problem except "customizing" for unique applications.

The effectiveness of our consultation service depends on the information you furnish. Be sure to tell us:

- The Model number and Series number from the blue and white label.
- The date of purchase.
- An exact description of the difficulty.
- Everything you have done in attempting to correct the problem.

Also include switch positions, connections to other units, operating procedures, voltage readings, and any other information you think might be helpful.

Please do not send parts for testing, unless this is specifically requested by our Consultants.

Hints: Telephone traffic is lightest at midweek. . .please be sure your Manual and notes are on hand when you call.

Heathkit Electronic Center facilities are also available for telephone or "walk-in" personal assistance.

REPAIR SERVICE

Service facilities are available, if they are needed, to repair your completed kit. (Kits that have been modified, soldered with paste flux or acid core solder, cannot be accepted for repair.)

If it is convenient, personally deliver your kit to a Heathkit Electronic Center. For warranty parts replacement, supply a copy of the invoice or sales slip.

If you prefer to ship your kit to the factory, attach a letter containing the following information directly to the unit:

- Your name and address.
- Date of purchase.
- Copies of all correspondence relevant to the service of the kit.
- A brief description of the difficulty.
- Authorization to return your kit C.O.D. for the service and shipping charges. (This will reduce the possibility of delay.)

Check the equipment to see that all screws and parts are secured. (Do not include any wooden cabinets or color television picture tubes, as these are easily damaged in shipment.) Place the equipment in a strong carton with at least THREE INCHES of *resilient* packing material (shredded paper, excelsior, etc.) on all sides. Use additional packing material where there are protrusions (control sticks, large knobs, etc.). If the unit weighs over 15 lbs., place this carton in another one with 3/4" of packing material between the two.

Seal the carton with reinforced gummed tape, tie it with a strong cord, and mark it "Fragile" on at least two sides. Remember, the carrier will not accept liability for shipping damage if the unit is insufficiently packed. Ship by prepaid express, United Parcel Service, or insured Parcel Post to:

Heath Company
Service Department
Benton Harbor, Michigan 49022

HEATH

Schlumberger

MP MASTER

MA22908

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